

by the oldest Palæozoic formations, from which they are marked off by so striking a contrast of structure and composition, and to which they have contributed so vast an amount of detrital material. But it must be tested by the evidence of the rocks themselves, not only where the geological record is confessedly incomplete, but where it is comparatively full. Nowhere among the lowest gneisses is any structure observable which can be compared with the superficial portion of a lava that cooled at the surface. On the contrary, the analogies they furnish are with deep-seated and slowly-cooled sills and bosses. The supposed intercalation and alternation of limestone and other presumably sedimentary materials in the old gneisses are probably all deceptive. In some regions they can be shown to be so, and it can there be demonstrated that the gneisses are really eruptive rocks which pierce the adjacent sedimentary or schistose masses, and are thus of younger age than these. If this relation can be clearly established in regions where the evidence is fullest, it is obviously safe to infer that a similar relation might be discoverable if the geological record were more complete, even in those parts of the world where the break between the lowest gneisses and the Palæozoic formations seems to be most pronounced. At least the possibility that such may be the case should put us on our guard against adopting any crude speculation about the original crust of the earth.

The present condition of these ancient rocks differs much from that which they originally possessed. In particular they have undergone enormous mechanical deformation, have been to a large extent crushed and recrystallized, and have acquired a marked schistose structure. But in every large region where they are developed we may obtain